WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device comprising steps of:

irradiating a linear laser beam to a surface of a semiconductor in a gas atmosphere containing an impurity while scanning the linear laser beam; and

applying an electromagnetic energy to the gas atmosphere so as to decompose the gas containing the impurity while irradiating the linear laser beam.

2. The method according to claim 1 wherein the gas atmosphere comprises a gas selected from the group consisting of AsH_3, PH_3, BF_3, BCl_3 and $B(CH)_3)_3$.

3. The method according to claim 1 further comprising a step of heating the semiconductor at a temperature not higher than a crystallization temperature of said semiconductor while applying the electromagnetic energy.

4. A method of manufacturing a semiconductor device comprising steps of:

providing a semiconductor film comprising silicon formed over a substrate in a chamber;

transferring the substrate in a first direction;

introducing a gas containing a dopant species into the chamber;

irradiating the semiconductor film with a laser light through a window having a slit shape while transferring the substrate so that the dopant species is introduced into the semiconductor film; and

heating the semiconductor film during a laser light irradiation.

5. The method of claim 4 wherein the semiconductor film is heated not lower than 200 degree C.

6. A method of manufacturing a semiconductor device comprising steps of:

providing a semiconductor film comprising silicon over a substrate in a chamber;

transferring the substrate in a first direction;

introducing a gas containing a dopant species into the chamber;

applying an electromagnetic energy to the gas in order to activate the gas; and

irradiating the semiconductor film with a laser light through a window having a slit shape while transferring the substrate so that the dopant species is introduced into the irradiated portion of the semiconductor film.

7. The method according to claim 6 further comprising heating the semiconductor film during a laser light irradiation.

8. A method of manufacturing a semiconductor device comprising steps of:

holding a substrate in a chamber;

introducing a gas containing dopant species into the chamber;

producing a plasma of said gas;

introducing said dopant species from said plasma into an entirety of a line-shaped target portion of said substrate;

changing a relative position of the substrate in said chamber.

9. The method according to claim 8 further heating said substrate.

10. The method according to claim 8 wherein said substrate has a semiconductor layer formed thereon.

11. The method according to claim 8 wherein said gas is selected from the group consisting of PH_3 and B_2H_6.

12. The method according to claim 8 wherein said gas is selected from the group consisting of AsH_3, PH_3, BF_3, BCl_3, and $B(CH_3)_3$.

13. A method of manufacturing a semiconductor device comprising steps of:

producing a plasma of a gas which contains dopant species;

introducing said dopant species from said plasma into an entirety of a line-shaped target portion of a semiconductor film;

changing a relative position of the line-shaped target portion over the semiconductor film.

14. The method according to claim 13 further heating said substrate.

15. The method according to claim 13 wherein said substrate has a semiconductor layer formed thereon.

16. The method according to claim 13 wherein said gas is selected from the group consisting of PH_3 and B_2H_6.

17. The method according to claim 13 wherein said gas is selected from the group consisting of AsH_3, PH_3, BF_3, BCl_3, and $B(CH_3)_3$.

18. The method according to claim 13 wherein said semiconductor device includes a thin film transistor.